

Name: _____
A2CC: Complex Fractions

Date: _____

Do Now:

Perform the indicated operations and simplify.

1. $\frac{a}{a+2} - \frac{2}{3-a} - \frac{3a+1}{a^2-a-6}$

2. $\frac{x^2-9}{27+3x^2} \cdot \left(\frac{x^2+x-6}{x-4} \div \frac{6-x-x^2}{3x-12} \right)$

A fraction in which the numerator or denominator contains one or more fractions or negative exponents is called a *complex fraction*.

1. Simplify $\frac{\frac{3}{2} + \frac{3}{x}}{2 + \frac{4}{x}}$

Method 1

Method 2

Steps

1. Combine fractions in numerator
2. Combine fractions in denominator
3. Rewrite as a division problem
4. Follow rules for division

Steps

1. Find LCD of all "little" fractions
2. Multiply entire fraction by LCD of all denominators
3. Simplify

Simplify each of the following.

$$2. \frac{\frac{7}{3} + \frac{1}{w}}{\frac{2}{w} - \frac{1}{3}}$$

$$9. \frac{1+a^{-1}}{a-a^{-1}}$$

$$3. \frac{\frac{a-b}{a}}{\frac{a}{b}-1}$$

$$10. \frac{x^{-1}+y^{-1}}{x^{-1}-y^{-1}}$$

$$4. \frac{x-\frac{1}{x}}{1-\frac{1}{x}}$$

$$11. \frac{x^{-2}-1}{1+x^{-1}}$$

$$5. \frac{\frac{1}{x}-\frac{1}{y}}{\frac{1}{x}+\frac{1}{y}}$$

$$12. \frac{\frac{1}{4x^2}-1}{2-x^{-1}}$$

$$6. \frac{\frac{n-\frac{1}{n}}{1-n^2}}{n}$$

$$13. \frac{xy^{-1}+z}{xz^{-1}+y}$$

$$7. \frac{1-\frac{1}{x}}{x-2+\frac{1}{x}}$$

$$14. \frac{\frac{x}{x+1}}{1-\frac{x}{x+1}}$$

$$8. \frac{\frac{a}{a+b}}{1-\frac{b}{a+b}}$$

$$15. \frac{xy^{-1}+1}{2+x^{-1}}$$

$$16. \frac{4u^{-1} + (uv)^{-1}}{v^{-1} - 5}$$

$$23. \frac{\frac{3}{x-2} - \frac{3}{x+2}}{\frac{12}{x^2-4}}$$

$$17. \frac{t^{-1} + 2^{-1}}{3t^{-1} - 3^{-1}}$$

$$18. \frac{1 + \frac{4}{x} + \frac{3}{x^2}}{1 - \frac{9}{x^2}}$$

$$19. \frac{\frac{3}{b} - 1}{1 - \frac{6}{b} + \frac{9}{b^2}}$$

$$20. \frac{1 + \frac{2}{y} - \frac{24}{y^2}}{1 + \frac{4}{y} - \frac{12}{y^2}}$$

$$21. \frac{\frac{1}{k} - \frac{3}{k^2} + \frac{2}{k^3}}{\frac{1}{k} - \frac{4}{k^2} + \frac{4}{k^3}}$$

$$22. \frac{1 + \frac{7}{y-2}}{1 + \frac{3}{y+2}}$$